NEW PRODUCT

3300 XL Rotary Position Transducer System

A Better Choice for Measuring Valve Position

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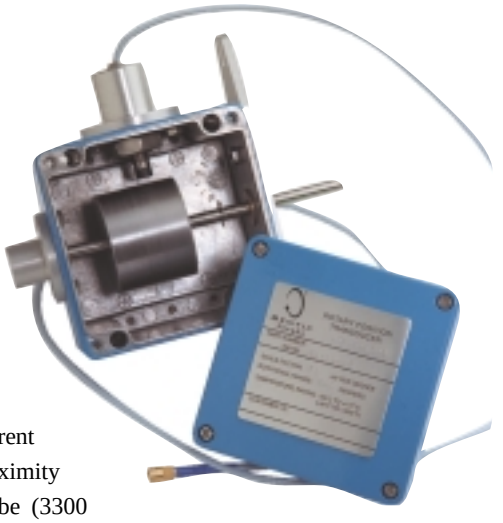
A complete Turbine Supervisory Instrumentation (TSI) System for steam turbine generators normally includes a measurement of the position of governor valves to assist in determining steam flow. Knowing the valve position provides an indication of turbine load while the generator is online. Correlating the valve position with other process measurements, such as steam temperature, is useful in determining overall turbine operating efficiency. The governor valve position can then be adjusted and monitored to optimize the machine operating efficiency.

Beginning with our 7000 Series monitors introduced in 1972, Bently Nevada has provided valve position monitoring capabilities as part of a TSI system. These monitors are typically set to display valve position as percent open or percent closed, based on the full range of motion for each valve or on the percent of the full range of rotation of a camshaft that operates numerous valves. Historically, the transducers used for making valve position measurements have been either Linear Variable Differential Transformers (LVDTs) or rotary potentiometers. In particular, rotary potentiometers have a history of very poor reliability due to moving parts and brushes that wear out.

3300 XL Rotary Position Transducer (3300 XL RPT)

To provide a more reliable measurement, Bently Nevada has developed an innovative rotary position transducer. The new 3300 XL RPT attaches to the end of a steam valve control shaft using a flexible coupling. A *self-contained package*, it uses a non-contacting eddy current proximity probe (3300 XL) to view a precisely machined, eccentric cylinder that rotates with valve position. As the steam turbine control valve opens or closes, the steam control valve shaft and the 3300 XL RPT cylinder rotate. Probe gap is such that the distance between the eccentric cylinder and the probe varies as the cylinder rotates. A change in gap voltage is proportional to a change in the valve opening.



3300 XL RPT Features

Reliability

Eddy current transducer systems operate using non-contacting technology for observing a conductive target material. Thus, the instrumentation does not experience wear due to friction. The absence of contacting parts also prevents the transducer from "sticking," which would adversely affect the accuracy of the measurement. Both sticking and frictional wear are common problems with rotary potentiometers. The result is that the 3300 XL RPT is much more reliable and accurate for valve position measurements than rotary potentiometers.

Robustness

All components of the 3300 XL RPT (8 mm housing, cylinder, probe, and extension cable) are designed to provide a stable output in ambient temperatures of up to 177 °C (351 °F). Thus, it is ideal for the high temperature conditions commonly encountered near the end of the steam control valve shaft on most steam turbines. The Proximitor® Sensor must be located five or nine meters from the probe tip and is stable up to 85 °C (185 °F).

Accuracy

Further improving its measurement accuracy, the 3300 XL RPT comes with three different ramp configurations, which vary according to the total rotational range required. Ramps are available for varying degrees of camshaft rotation: 0 to 100 degrees, 101 to 200 degrees, and 201 to 300 degrees.

Integrity

Inherent in the 3300 XL RPT is advanced "Transducer OK" checking that will annunciate problems with the transducer, such as an open or short circuit. This advanced OK checking makes it much easier to identify any instrumentation problems.

Monitoring System Compatibility

The 3300 XL RPT is designed to work with the 3500/45 Position Monitor with 3500 configuration software versions 3.00 or later. The 3300/70 Dual-Valve Position Indicator can also be modified to work with the 3300 XL RPT – contact Bently Nevada's Custom Design Department for additional details.

For additional information regarding Valve Position Measurements and the 3500/45 Position Monitor, please refer to the article, "3500 TSI Valve Position – Now Part of the 3500/45 Position Monitor," *ORBIT*, Vol. 20 No. 2, 1999, pp. 37-38.

Summary

For the most reliable and accurate valve position measurements possible, we are pleased to offer the new 3300 XL Rotary Position Transducer. It is recommended for all new installations, and as a retrofit where rotary potentiometers are currently used and where a compatible monitoring system exists or can be retrofitted. More information about this transducer is available on our website at www.bently.com or by contacting your nearest Bently Nevada office.